



# **Space Sciences Laboratory Publications and Presentations, January 1–December 31, 1997**

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## TECHNICAL MEMORANDUM

### NASA REPORTS

#### Special Publications

1. The Bursting Pulsar GRO J1744-28. ESA SP-382, Publication Division, ESTEC, The Netherlands, 1997. C. Kouveliotou (ES84).
2. Discovery in Cygnus X-3 of Correlations Between the Hard X-Ray and the Radio. ESA SP-382 by ESA's Publications Division at ESTEC, Noordwijk, The Netherlands, 1997. M.L. McCollough, B.A. Harmon, R.M. Hjellming, C.R. Robinson, and S.N. Zhang (ES84).
3. High Energy Survey of Supernova Remnants with BATSE. ESA SP-382 by ESA's Publication Division at ESTEC, Noordwijk, The Netherlands, 1997. M.L. McCollough, C.A. Wilson-Hodge, S.N. Zhang, and B.A. Harmon (ES84).

#### Contractor Reports

1. Evaluation of Optimum HgZnTe Crystal Growth Parameters and USML-2 Flight Support—Final Report. NASA Contractor Report, 1997. R.N. Scripa (ES75/UAB).
2. Second International Microgravity Laboratory (IML-2) Final Report. NASA RP-1405, July 1997. R.S. Snyder (ES01).
3. X-ray Transmission Microscope Development—Final Report, February 28–August 31, 1997. NASA Contractor Report, 1997. W.F. Kaukler (ES75/UAH).

#### Technical Memorandums

1. Microgravity Processing and Photonic Applications of Organic and Polymeric Materials. NASA TM-108533, 1997. CDDF Final Report #95-26. D.O. Frazier, M.S. Paley, B.G. Penn, H.A. Abdeldayem, D.D. Smith, and W.K. Witherow (ES01).
2. Second United States Microgravity Laboratory (USML-2) One Year Report. NASA TM-4737, 1997. M. Vlasse, P.A. Curreri, D. McCauley, and C. Walker (ES71).
3. Space Sciences Laboratory Publications and Presentations, January 1–December 31, 1996. NASA TM-108540, 1997. F. Summers (ES01).

#### Technical Paper

1. Gauging the Nearness and Size of Cycle Minimum. NASA TP-3674, 1997. R.M. Wilson, D.H. Hathaway, and E.J. Reichmann (ES82).

## OPEN LITERATURE

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2. 3-D Magnetic Field Configuration Late in a Large Two-Ribbon Flare. *Solar Physics*, 176, 153–169, 1997. R.L. Moore, B. Schmieder, D.H. Hathaway, and T.D. Tarbell (ES82).
3. Achieving Zero Current for Polar Wind Outflow on Open Flux. *Geophys. Res.*, 24(10), 1183–1186, May 15, 1997. G.R. Wilson, G. Khazanov, and J.L. Horwitz (ES83).
4. Alfvén Wave Resonances and Flow Induced by Nonlinear Alfvén Waves. *Solar Wind*, 8 (D. Winterhalter, J.T. Gosling, S. Habbal, W.S. Kurth, and M. Neugebauer, eds.), American Inst. of Physics. Conf. Proc. 382, p. 153, Woodbury, NY, 1996. B.A. Stark, Z.E. Musielak, and S.T. Suess (ES82).
5. Analysis of Vegetation Within a Semi-Arid Urban Environment Using High Spatial Resolution Airborne Thermal Infrared Remote Sensing Data. *Atmos. Environ.*, 32(1), 19–33, October 1997. D.A. Quattrochi and M.K. Ridd (ES41).
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8. Broadband High-Energy Observations of the Superluminal Jet Source GRO J1655-40 During an Outburst. *Astrophys. J.*, 479, 381–387, April 10, 1997. S.N. Zhang, K. Ebisawa, R. Sunyaev, Y. Ueda, B.A. Harmon, S. Sazonov, G.J. Fishman, H. Inoue, W.S. Paciesas, and T. Takahashi (ES84).
9. Buoyancy-Driven Heat Transfer During Application of a Thermal Gradient. *J. Crys. Growth*, 171(1/2), 288–302, January 11, 1997. D.O. Frazier, R.J. Hung, M.S. Paley, B.G. Penn, and T.Y. Long (ES01).
10. Calculation of Static Third-Order Polarizabilities of Large Organic Molecules. *J. Phys. Chemistry*, 101(11), 2207–2214, 1997. B.H. Cardelino, C.E. Moore, and D.O. Frazier (ES75).
11. Cancellation of Photo-Induced Absorption in Metal Nanoparticle Composites Through a Counterintuitive Consequence of Local Field Effects. *J. Optical Soc. of America B*, 14(7), 1625–1631, July 1997. D.D. Smith, G. Fisher, R.W. Boyd, and D.A. Gregory (ES76).

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12. CCD Video Observation of Microgravity Crystallization of Lysozyme and Correlation with Accelerometer Data. Accepted by *Acta Crystallographica Section D*, D53, 747–755, 1997. E.H. Snell, T.J. Boggon, J.R. Helliwell, M.E. Moskowitz, and A. Nadarajah (ES76).
13. Change in Ion Distribution Function While Crossing the Space Shuttle Wake. *J. Geophys. Res.*, 102(A11), 24,117–24,126, November 1997. J.E. Sorenson, N.H. Stone, and K.H. Wright (ES83).
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9. Combined Effects of Photoelectrons, the Ponderomotive Force, and Precipitation in the Dynamics of the Polar Wind. 1997 Spring American Geophysical Union Meeting, Baltimore, MD, May 1997, *Eos*, 78(17), 290, 1997. G.V. Khazanov, M.W. Liemohn, and T.E. Moore (ES83).
10. Comparisons of Conical Ion Velocity Distributions from TIMAS and TIDE on the Polar Spacecraft. 1997 Spring Meeting of the American Geophysical Union, Baltimore, MD, May 27–30, 1997. *Eos*, 78(17), 271–272, 1997. M.M. Huddleston, J.H. Waite, C.J. Pollock, D.T. Young, M. Wuest, J.L. Burch, R.H. Comfort, B.L. Giles, M.O. Chandler, T.E. Moore, E.G. Shelley, H. Collin, W.K. Peterson, and A. Johnstone (ES83).
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13. Conjugate Observations of Optical Aurora with POLAR Satellite and Ground Based Imagers in Antarctica. 1997 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 8–12, 1997. *Eos*, 78(46), 619, 1997. S. Mende, H. Frey, H. Vo, S.P. Geller, J.H. Doolittle, and J.F. Spann, Jr. (ES83).
14. A Correlation Between Length of Strong-Shear Neutral Lines and Total X-ray Brightness in Active Regions. 28th Meeting of the Solar Physics Div. of the AAS, Bozeman, MT, June 27–July 1, 1997, *Bull. AAS*, 29(2), 885, 1997. D.A. Falconer (ES82).
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17. Expansion Factors in Coronal Holes and Plume/Interplume UVCS Observations. 28th Meeting of the Solar Physics Div. of the AAS, Bozeman, MT, June 27–July 1, 1997, *Bull. AAS*, 29(2), 881, 1997. G. Poletto, G. Corti, S. Suess, J. Kohl, et al. (ES82).
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22. Global MHD Magnetospheric Simulation of January 10, 1997. 1997 Spring Meeting of the American Geophysical Union, Baltimore, MD, May 27–30, 1997. *Eos*, 78(17), 288, 1997. R. Elsen, R.M. Winglee, M.J. Brittnacher, G.K. Parks, J.F. Spann, Jr., and G.A. Germany (ES83).

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26. Low Energy and Heavy Ion Content of Polar Plasma Outflows. 1997 Spring Meeting of the American Geophysical Union, Baltimore, MD, May 27–30, 1997. *Eos*, 78(17), 285, 1997. T.E. Moore, M.O. Chandler, P.D. Craven, B.L. Giles, C.J. Pollock, and D.C. Delcourt (ES83).
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37. Origin of the Slow Solar Wind and Dynamics of the Equatorial Streamer Belt. 1997 Spring Meeting of the American Geophysical Union, Baltimore, MD, May 27–30, 1997. *Eos*, 78(17), 252–253 1997. S.T. Suess (ES82).
38. Panel Achieves Consensus Prediction of Solar Cycle 23. *Eos*, 78, 211–212, 1997. J.A. Joselyn, J.B. Anderson, H. Coffey, K. Harvey, D. Hathaway, G. Heckman, E. Hildner, W. Mende, K. Schatten, R. Thompson, A.W.P. Thomson, and O.R. White (ES82).
39. Polar Wind in the Context of the Auroral Plasma Fountain for 2 to 8 RE. 1997 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 8–12, 1997, *Eos*, 78(46), F586, 1997. T.E. Moore, B.L. Giles, M.O. Chandler, C. R. Chappell, P.D. Craven, Y.-J. Su, J.L. Horwitz, and C.J. Pollock (ES83).
40. Polar Wind Survey with TIDE/PSI Suite Aboard POLAR. 1997 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 8–12, 1997, *Eos*, 78(46), F602, 1997. Y.-J. Su, J.L. Horwitz, T.E. Moore, M.O. Chandler, P.D. Craven, and B.L. Giles (ES83).
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42. Predictions of the On-Orbit Performance of AXAF's Optics. *Bull. AAS*, 29(2), 814, June, 1997. D. Jerius, P. Zhao, L. van Speybroeck, A. Tennant, D. Swartz, D.A. Schwartz, W.A. Podgorski, B. Harris, D.E. Graessle, T.J. Gaetz, M.D. Freeman, R. F. Elsner, R.J. Edgar, and L.M. Cohen (ES84).
43. Quantifying the Complexity of Flaring Active Regions. 28th Meeting of the Solar Physics Div. of the AAS, Bozeman, MT, June 27–July 1, 1997, *Bull. AAS*, 29(2), 900, 1997. B.A. Stark and M.J. Hagyard (ES82).

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45. A Search for Plasmaspheric Materials in the Lobe Using ISTP. 1997 Spring Meeting of the American Geophysical Union, Baltimore, MD, May 27–30, 1997. *Eos*, 78(17), 309, 1997. R.E. Elphic, M.F. Thomsen, D.J. McComas, R.H. Comfort, P.D. Craven, T.E. Moore, and F. Mozer (ES83).
46. Self-Consistent Effects of Superthermal Electrons and a Trapped Hot Population on Plasmaspheric Refilling. 1997 Spring Meeting of the American Geophysical Union, Baltimore, MD, May 27–30, 1997. *Eos*, 78(17), 286, 1997. M.W. Liemohn, and G.V. Khazanov (ES83).
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50. Survey of the Polar Wind from 5000 km to  $8 R_E$  Altitude with POLAR. 1997 Spring Meeting of the American Geophysical Union, Baltimore, MD, May 27–30, 1997. *Eos*, 78(17), 294, 1997. Y.-J. Su, J.L. Horwitz, M. Hirahara, T.E. Moore, M.O. Chandler, B.L. Giles, P.D. Craven, C.J. Pollock, and J. Scudder (ES83).
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1. 3-D Magnetic Field Configuration Late in a Large Two-Ribbon Flare. 28th Meeting of the Solar Physics Div. of the AAS, Bozeman, MT, June 27–July 1, 1997. R.L. Moore, B. Schmieder, D.H. Hathaway, and T.D. Tarbell (ES82).
2. AB Initio Calculations on the Diacetylene Dimer. Ninth International Congress of Quantum Chemistry, Atlanta, GA, June 9–14, 1997. B.H. Cardelino, C.E. Moore, D.O. Frazier, D.G. Musaev, and K. Morokuma (ES75).
3. Advanced X-Ray Astrophysics Facility. AXAF—An Overview. Invited talk to Meeting of the High Energy Astrophysics Division (HEAD), Denver, CO, November 4–11, 1997. M.C. Weisskopf (ES01).
4. Anomalies in Coupled Energy and Water Budgets Over the Americas as Diagnosed from Pre-EOS Data Sets. AMS Annual Meeting, San Diego, CA, February 1997. F.R. Robertson and S. Marshall (ES41).
5. Application of Real-Time X-Ray Transmission Microscopy to Fundamental Studies of Metal Alloy Solidification. SPACEBOUND '97 Conference on Gravitational Materials, Montreal, Quebec, Canada, May 11–14, 1997. P.A. Curreri, W.F. Kaukler, S. Sen, and P.N. Peters (ES75).
6. Application of Remotely Sensed Data to Land Surface/Atmosphere Coupled Modeling Issues. 77th American Meteorological Society, Long Beach, CA, February 2–7, 1997. W.M. Lapenta, M. Lakhtakia, F.R. Robertson, R.T. McNider, A. Song, and J. Luvall (ES41).
7. Applications of Bayesian Statistics to Problems in Gamma Ray Bursts. Aspen Center for Physics Workshop on Gamma-Ray Bursts, Aspen, CO, August 25–29, 1997. C.A. Meegan (ES84).
8. Aromaticity in Multidimensional Molecules and Their Nonlinear Optical Properties. 26th Southeast Theoretical Chemistry Association Meeting, Birmingham, AL, May 16–17, 1997. C.E. Moore, B.H. Cardelino, T. Timofeeva, J. Niles, X.-Q. Wang, and D.O. Frazier (ES75).
9. The BATSE Catalog of Gamma-Ray Bursts. High Energy Astrophysics Division (HEAD) 1997 Meeting, Estes Park, CO, November 3–7, 1997. C.A. Meegan (ES84).
10. Bridgman Growth of Germanium. U.S.-Russian Space STAC Symposium, Huntsville, AL, November 10–13, 1997. F.R. Szofran, M.P. Volz, S.D. Cobb, and S. Motakef (ES75).
11. Bulk Growth of Wide Band Gap II-VI Compound Semiconductors by Physical Vapor Transport. SPIE's Annual Meeting, San Diego, CA, July 27–August 1, 1997. C.-H. Su (ES75).
12. Bulk Ion Parameters Derived from TOPAZ III/STICS. IPELS, 1997 Conference, Maui, HI, June 23–27, 1997. V.N. Coffey, M.O. Chandler, and T.E. Moore (ES83).
13. CdTe and (Cd, Zn) Te Crystals Grown by Physical Vapor Transport: Morphology and Its Dependence on the Growth Conditions. W. Palosz, K. Grasza, D.C. Gillies, M.A. George, E.E. Collins, K.-T. Chen, Y. Zhang, Z. Hu, A. Burger, H. Chung, B. Raghothamachar, and M. Dudley (ES75).

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14. Characterization of Structural Defects in Zinc Selenide Grown by Physical Vapor Transport. 11th Annual National Conference of Black Physics Students at the Massachusetts Institute of Technology (MIT), Boston, MA, February 27–March 2, 1997. R.D. Jones, J.-C. Wang, S.L. Lehoczky, D.C. Gillies, and C.-H. Su (ES75).
15. Characterization of Surface Energy Fluxes in a Great Basin Desert Valley. Annual Meeting of the Association of American Geographers, Ft. Worth, TX, April 1–5, 1997. D.A. Quattrochi and C.A. Laymon (ES41).
16. Characterizing Remote Sensing Images Using ICAMS. Annual Meeting of the Association of American Geographers, Ft. Worth, TX, April 1–5, 1997. H.-L. Qui, N.S.-N. Lam, and D.A. Quattrochi (ES41).
17. Chemical Processing and Analysis of “JACEE” Circumpolar Flights 13 and 14. Cosmic Ray JACEE Meeting, Hiroshima, Japan, December 5–14, 1997. W.F. Fountain (ES84).
18. Consistency Between Divergent Circulations from Reanalysis Data Sets and Satellite-Derived Precipitation, Radiation, and Surface Fluxes. Reanalysis Meeting, Washington, DC, October 27–31, 1997. F.R. Robertson, D. Fitzjarrald, and E.W. McCaul, Jr. (ES41).
19. A Critical Assessment of Protein Crystal Growth in Microgravity. American Crystallographic Association Meeting, St. Louis, MO, July 19–25, 1997. M.L. Pusey (ES76).
20. Crystal Growth and Characterization of Vanadium Doped and Undoped CdSSe. SPIE 42nd Annual Meeting, San Diego, CA, July 27–August 1, 1997. K.-T. Chen, Y.F. Chen, M. Davis, S.H. Morgan, A. Burger, C.-H. Su, M.P. Volz, and S.L. Lehoczky (ES75).
21. Crystal Growth of Solid Solution HgCdTe Alloys. Science and Tech. Advisory Council Meeting, Huntsville, AL, November 10, 1997. S.L. Lehoczky (ES71).
22. Crystalline Colloidal Arrays in Polymer Matrices. NASA URC Technical Conference, Albuquerque, NM, February 16–19, 1997. H.B. Sunkara, B.G. Penn, D.O. Frazier, and N. Ramachandran (ES76).
23. Data Analysis for the Scintillating Optical Fiber Calorimeter (SOFICAL). SCIFI97, Scintillating and Fiber Detectors Conference, South Bend, IN, November 2–6, 1997. M.J. Christl (ES84).
24. Dielectric Spectroscopy Study of ZnSe Grown by Physical Vapor Transport. 1997 Annual Fall MRS Meeting, Boston, MA, December 3, 1997. J. Kokan, R. Gerhardt, and C.-H. Su (ES75).
25. The Effects of pH on the Averaged (110) Face Growth Rates of Tetragonal Lysozyme. Spacebound 97, Montreal, Quebec, Canada, May 11–14, 1997. E. Forsyth, A. Nadarajah, and M.L. Pusey (ES76).
26. Energy Calibration of the Scintillating Optical Fiber Calorimeter Chamber (SOFICAL). 25th International Cosmic Ray Conference, Durban, South Africa, July 28–August 8, 1997. M.J. Christl, W.F. Fountain, T. Parnell, F.E. Roberts, J.C. Gregory, J. Johnson, and Y. Takahashi (ES84).
27. An Evaluation of Fractal Surface Measurement Methods Using ICAMS (Image Characterization and Modeling System). Auto-Carto 13, Seattle, WA, April 7–10, 1997. N.S.-N. Lam, H.-L. Qiu, and D.A. Quattrochi (ES41).

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28. Excursion Set Mediated Evolutionary Strategy. International Conference on Artificial Neural Networks and Genetic Algorithms, Norwich, England, April 2–4, 1997. S. Baskaran and D.A. Noever (ES76).
29. Expansion Factors in Coronal Holes and Plume/Interplume UVCS Observations. 28th Meeting of the Solar Physics Div. of the AAS, Bozeman, MT, June 27–July 1, 1997. G. Poletto, G. Corti, S.T. Suess, J. Kohl, et al. (ES82).
30. Floating-Zone Growth of Silicon in Strong Axial Magnetic Fields. Joint Annual Meeting of the German Society for Crystal Growth and the Italian Association, Freiburg, Germany, March 5–7, 1997. A. Croll, F.R. Szofran, P. Dold, Th. Kaiser, K.W. Benz, and S.L. Lehoczky (ES75).
31. Fluorescence Studies of Protein (Lysozyme) Crystal Nucleation. Spacebound 97, Montreal, Quebec, Canada, May 11–14, 1997. M.L. Pusey, D. Einhorn, and L. Smith (ES76).
32. A Fractal Module for Multispectral Image Analysis in ICAMS. 1997 Association of American Geographers Annual Meeting. W. Zhao, N.S.-N. Lam, and D.A. Quattrochi (ES41).
33. Galactic Superluminal Sources: A Multiwavelength Overview. 190th Meeting of American Astronomical Society (AAS), Winston-Salem, NC, June 8–11, 1997. B.A. Harmon (ES84).
34. Gamma-Ray Bursts—An Update. University of Kentucky, Lexington, KY, December 5, 1997. G.J. Fishman (ES81).
35. Gamma-Ray Bursts: Observational Overview. Italian Space Agency, Elba, Italy, May 25, 1997. G.J. Fishman (ES81).
36. Gamma-Ray Bursts: Where are we now? “Non-Sleeping Universe: From Galaxies to the Horizon” Conference, Porto, Portugal, November 27–29, 1997. C.A. Meegan (ES84).
37. GLAST Mission: Using Scintillating Fibers as Both the Tracker and the Calorimeter (The). SCIFI97-Conference, University of Notre Dame, South Bend, IN, November 2, 1997. G.J. Fishman (ES81).
38. Global Auroral Imaging As a Remote Diagnostic of Geospace. AIAA, 28th Plasmadynamics and Lasers Conference, Atlanta, GA, June 1997. G.A. Germany, P.G. Richards, G.K. Parks, M.J. Brittnacher, and J.F. Spann, Jr. (ES83).
39. Global Characteristics of Lightning Occurrence from Nighttime Digital DMSF Data. The Second International Symposium on Lightning, Haute-Savoie, France, June 1–5, 1997. R.G. Barry, S.J. Goodman, R. Swick, and G. Scharfen (ES41).
40. Global Warming: What We Do and Do Not Know. Central Alabama Section of the American Institute of Chemical Engineers, Birmingham, AL, May 20, 1997. R.W. Spencer (ES41).
41. Gravitational Effects on Dynamic-Solidification Behavior in Single-Crystal-Stainless Steel. Materials Research Society, Fall Meeting, Boston, MA, December 1–5, 1997. D.P. Corrigan, L.A. Boatner, M.E. Glicksman, P.A. Curreri, and G. Workman (ES75).

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42. Grazing Incidence Nickel Replicated Optics. Structure and Evolution of the Universe Technology Working Group Meeting, Greenbelt, MD, April 1, 1997. J.J. Petruzzo, R.F. Elsner, M.K. Joy, S.L. O'Dell, and M.C. Weisskopf (ES84).
43. GRO J2058+42 X-Ray Observations. 4th Compton Symposium, Williamsburg, VA, April 27–30, 1997. C.A. Wilson-Hodge, M.H. Finger, B.A. Harmon, R.B. Wilson, D. Chakrabarty, and T. Strohmayer (ES84).
44. Growth and Characterization of Cadmium-Telluride Crystals Grown by Physical Vapor Transport. 11th International Conference on Ternary and Multinary Compounds, Salford, United Kingdom, September 8–12, 1997. W. Palosz, K. Graszka, D.C. Gillies, M.A. George, E.E. Collins, K.-T. Chen, Y. Zhang, Z. Hu, A. Burger, H. Chung, B. Raghothamachar, and M. Dudley (ES75).
45. The ICAMS (Image Characterization and Modeling Software) for Measuring, Characterizing, and Modeling Multiscale Remote Sensing Data. D.A. Quattrochi, N.S.-N. Lam, and H.-L. Qiu. RGS-IBG Annual Meeting, Exeter, U.K., January 6–10, 1997.
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## APPENDIX

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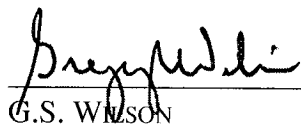


## **APPROVAL**

### **SPACE SCIENCES LABORATORY PUBLICATIONS AND PRESENTATIONS, JANUARY 1-DECEMBER 31, 1997**

Compiled by F.G. Summers

The information in this report has been reviewed for technical content. Review of any information concerning Department of Defense or nuclear energy activities or programs has been made by the MSFC Security Classification Officer. This report, in its entirety, has been determined to be unclassified.

A handwritten signature in dark ink, appearing to read "G.S. Wilson", is written over a horizontal line.

G.S. WILSON

DIRECTOR, SPACE SCIENCES LABORATORY

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